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Embarking on a professional career: social advantage in dentistry and medicine

UK dental and medical student applications and admissions, 1996-2011

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ABSTRACT

Objectives: The objectives of this research were to compare trends in applications and admissions to dentistry and medicine by sociodemographic status, country/region, academic experience and attainment, for UK domiciled students; and to compare the odds of gaining admission to each course.

Methods: Secondary analysis of individual student data from University and College Admissions Services [UCAS] for focused, and successful, UK domiciled applicants whose preferred subject was medicine or dentistry over a 16-year period to 2011. Trends for both programmes were examined over time using univariate and multivariate analysis including logistic regression, first without (1996-2011 and 2002-2001); and, second with (2002-2001) tariff scores.

Results: UK admission ratios to dentistry and medicine are similar, fluctuating over this 16-year period. These professions attracted more applications from females, people of Asian ethnicity (particularly dentistry), direct entrants to university, pupils from selective schools (private and grammar) and Londoners; the latter forming over one fifth of all applicants to both programmes. Males, students of White and Black ethnicity, those from England (excluding London), and from lower social groups, were notably under-represented. Medicine attracted a higher proportion of students with high tariff scores. The odds of applicants gaining admission to dentistry and medicine (1996-2011) were lowest if male, mature (≥21 years), of Black ethnicity, from a lower socio-economic classification, or domiciled in England. When tariff was included in the model (2002-2011), the odds of acceptance for dentistry and medicine were significantly higher for applicants achieving high tariff scores. Whilst males were significantly less likely to gain admission, this disparity was greater for dentistry. White students were twice as likely to be admitted as their Black counterparts to both courses. Odds were moderated for social status by tariff and this was particularly so for dentistry. Applicants to dentistry and medicine had the lowest odds of admission if domiciled in England outside of London.

Discussion: Over a period when there was an expansion of higher education places, and the popularity of dentistry and medicine fluctuated, this unique analysis comparing medicine and dentistry highlights geographic disparities and demonstrates the extent to which certain groups remained under-represented amongst applicants, with social inequalities clearly reflected in admissions. Whilst there is an academic standard to be achieved for entrance to dentistry and medicine, complexity of the societal challenge in accessing these courses must not be underestimated. Social status, geographic region and selective schools remain important determinants of entry to these elite professions, emphasising the importance of educational reform in support of equity, with major implications for society and the need for concerted action,

particularly in England outside of London to attract under-represented groups, most notably white males.

Introduction

University in the United Kingdom [UK] has a long and particularly interesting history. In the 18th and 19th centuries, higher education [HE] was the preserve of the social elite, closely associated with public/private schools,[1] with access controlled by class, money, and from the mid-nineteenth century, examinations. Whilst the Beveridge Plan, followed by Education Act of 1944, opened university access to wider society, access to the elite universities remains strongly associated with socio-economic status, with successive government reports also highlighting inequity in access to the elite courses, particularly the professions [2-5].

The HE landscape has changed dramatically over past few decades, with implications for dental and medical school applications and ultimately these professions. First, diversification of policies has occurred following devolution of greater political powers to Scotland, Northern Ireland and Wales;[6-8] resulting in different university tuition fees and approaches to widening participation. [9-11] All medical and dental schools in England and Wales as part of Russell group universities opted to charge students the maximum fees; and, thus, have been required to implement widening participation initiatives to encourage and support students from disadvantaged backgrounds entering medical and dental courses.[12, 13]

Second, new dental and medical schools were opened to build workforce capacity;[14-16] and university places were expanded,[5, 17] together with introduction of graduate-entry programmes.[18, 19] All four UK nations have had a policy of increasing the proportion of young people entering higher education.[20-22] Whilst aspirations have been set at 50% for England,[23] and the number of available university places has risen overall, only one third of school leavers in England currently secure a university place.[24]

Third, developments within the admission process have included the introduction of UKCAT in 2006, and GAMSAT, the former is used by the majority of dental and medical schools. [25, 26] All schools use a combination of the UCAS application including their personal statement, academic predictions and an academic reference,[27] along with the outcome of their UKCAT or GAMSAT test and admissions interviews/assessment.

Fourth, wider global influences, such as the increasing perception of commodification of education and economic recession have influenced education across the UK.[28] Despite devolution establishing four governing bodies responsible for higher education within each constituent country,[6-8] all UK students apply to university through UCAS, enabling them to apply to any establishment in the UK.[29] Education is largely restricted to home/EU students, with a 5% cap on international student admissions in England and 7.5% for medicine.[30]

Past cross-sectional analyses of the two courses suggest that dentistry attracts, and admits, more females than males, in parallel with medicine and universities as a whole.[13, 31] Also, that dentistry is more attractive to minority ethnic applicants than medicine and university in general, with gender, ethnicity, maturity, and school type associated with probability of acceptance for dentistry,[32] and the challenges associated with the introduction of higher fees.[13] Whilst a recent paper highlights certain trends in medicine, no analyses, to the knowledge of the authors, have explored and compared trends over time and the implications of tariff on admission.[33]

Trend analysis will provide the opportunity to examine the predictors of acceptance to these two courses, enabling comparisons and thus inform the current debate on access to higher education for dentistry and medicine.

Objective

To examine and compare i) trends in application and admission to dentistry and medicine by sociodemographic status (age, gender, ethnicity, socio-economic classification), geography (country/region), academic experience (school), and attainment (tariff scores) for UK focused, and successful, applicants; and, ii) the odds of gaining admission.

Methods

UCAS is the central organisation through which applications are processed for entry to full-time higher education courses in the UK. This paper involves secondary analysis of individualised UCAS data for all applicants whose preferred subject line was dentistry during academic years 1996 to 2011, and all successful applicants. The term ‘applicants’ is used to denote focused applicants and refers to students with dentistry as their ‘preferred subject choice’ on their UCAS application. ‘Successful applicants’ or ‘admissions’ refers to students who accepted a place on a dental course. Ethics committee approval was not required as this research involved secondary analysis of anonymised data.

Applicants aged 21 years, or over, were classified as “mature” in line with UCAS procedures. In the data provided between 2001 and 2004, the “White” classification of ethnic origin was expanded to five separate categories: White British, White Irish, White Scottish, Irish traveller and other White. For the purposes of analysis, applicants from these five groups were combined into a single ‘White’ category from 2001 onwards. Additionally, the “Mixed” ethnic category was available for analysis.

Socio-economic status was provided according to the professional background of the head of the applicant’s household. For the years 1996-2001, UCAS assigned social class based on the applicant’s parental occupation (or the occupation of the person contributing the highest income to the household if the applicant was aged 21 years or over) using the Standard Occupational Classification 1990.[34] From 2002, UCAS assigned social status according to a simplified version of the National Statistics Socio-economic Classification 2001 (employment status and size of organisation information is not collected), using the Standard Occupational Classification 2000[35] up to 2008, after which information on the socio-economic status of students was no longer available.

School type was derived from the National Schools register, which changed in 2007, condensing the number of categories of schools from nine to five, with the reintroduction of a Sixth Form category in 2010. Schools were recoded into five categories – State, Independent, Grammar, Further Education and Other to facilitate analysis over time.

From 2002 entry, UCAS tariff replaced A-level points as the Main Qualification in UCAS data. The UCAS tariff score includes all A-level points (including AS points), although with a different point structure for each A-level grade. Points are also awarded for other/equivalent ‘benchmark’ qualifications (for example, International Baccalaureate Diplomas and Certificates and other degrees) to allow ‘established agreed equivalences between distinct types of qualifications, and reports achievement for entry to HE in a numerical format. This allows comparisons between applicants with different types and volumes of achievement’.[36] It should be noted that tariff points are also awarded for other diverse qualifications which provide ‘added value’, ranging from music examinations (Grades 6-8) to Sports Leaders UK and even British Horse Society certificates, thus tariff points (from 2002) and A level points (provided by UCAS 1996-2001) are non-comparable.

Statistical Analyses

Descriptive statistics were used to summarise the applicant population characteristics and admissions by year for each discipline. The Z-test for independent proportions was used to compare the application success rates. Applicants during the study period were coded as either accepted or not accepted and logistic regression used to identify the significant predictors of successful applications. The first model (1996-2011) included maturity, gender, ethnicity, UK region, school and socio-economic classification as predictors. The second model tested the same predictors for the time period 2002 to 2011. The third model (2002-11) included academic achievement, as denoted by tarriff score. All analyses were carried out using SPSS version 24.0. Additionally, ARIMA (Auto Regressive Integrated Moving Average) models were constructed to observe the change over time. All models were run for dentistry and medicine independently.

Results:

Over the 16-year period, there were 33,773 focused and 15,427 (45.7%) successful UK applicants to dentistry (Table 1), representing an admissions ratio of 2.19:1. The admission ratio was slightly lower at 2.01:1 for medicine, with 199,845 UK applicants and 99,478 admissions. Whilst the number of students admitted to both courses increased during the noughties (from 2003 onwards for medicine; 2004 for dentistry), there has been wide fluctuation in popularity over time, with a marked dip in applicant numbers in the early part of this decade (2002 for medicine and 2003 for dentistry), rising thereafter to more than double by 2011. The trends over the timer period are presented in the ARIMA models, S1-S13. When exploring trends in the characteristics of those accepted students in the coming sections, the fluctuation in the popularity of both courses is generally apparent.

Table 1

Variation in the profile of students applying for and admitted to both courses as outlined below starting with gender.

Table 2

First, whilst males have traditionally formed the majority of applicants and admissions, females exceeded males for the first time from 1999 in dentistry and consistently for medicine over this period. The proportion of successful female applications to dentistry was significantly higher ($p<0.05$) than males in all years, except 1998. Whereas in the earlier years, there was a similar

picture for medicine, which has not been the case from 2008 onwards. This pattern is observed over time (S2 and S3).

Second, the average age of applicants over the 16 years was 19.7 years (range 16-55 years) for dentistry and 20.4 years (range 16-57 years) for medicine. Admissions from mature students were more common for medicine from 2003 onwards and dentistry from 2004, although a lower proportion of mature applicants were accepted to both courses compared with applicants under 21 years for every year (S4 and S5).

Third, whilst over half of all applicants to dentistry were from minority ethnic groups, one third of applicants to medicine were from black and minority ethnic backgrounds. Acceptance rates for people of Black ethnicity were markedly lower than their White counterparts for dentistry (25.5% cf 55.7%) and medicine (23.4% cf 56.2%), consisently over the time period (S6 and S7).

Fourth, dentistry attracted about one quarter their applicants from London, and one fifth of applicants to medicine. A higher proportion of applicants from Scotland and Northern Ireland were successful than from England and Wales in each course. Similarly, the success rate was lower from London (38.5% dentistry; 38.7% medicine), and other areas in England (43.8%; 51.0%). The ARIMA models for region show clearly the greater proportion of applicants accepted from Scotland (and for medicine, Northern Ireland also), most notably compared with students from London (S8 and S9).

Fifth, applicants from selective schools had the highest admission rates for dentistry (54.1% independent, 55.5% grammar) and medical (63.9 independent, 60.9% grammar) admissions, observed every year over the time period (S10 and S11).

Sixth, and finally, a clear social gradient was present for dentistry and medicine with students from low socio-economic backgrounds having only a 40.3% chance of being selected for dentistry and 44% for medicine compared with higher socio-economic groups, cf 51.4% and 57% respectively. Although the proportion of acceptance for applicants from high socio-economic backgrounds was greater for both courses than students from lower ones, this was more apparent for medical applicants each year (S12 and S13).

Predictors of dental admission in UK, 1996-2011; 2002-11

Logistic regression analyses of variables predicting the success of applications for dentistry and medicine are presented in Table 3, without tarriff for the 16-year period (Model 1), and the 10-year period up to 2011 (Model 2); and, then including tarriff scores (Model 3). Comparing the

results of Models 1 and 2, which represent 16- and 11-year time periods respectively using the same variables, the patterns are largely similar.

In Model 3 (with tarriff, 2002-11), whilst students whose tariff points are medium or low have very low odds of admission to dentistry (OR=0.16 and 0.03 for medium and low tariff scores respectively) or medicine (OR=0.21 and 0.11 for medium and low tarriff scores respectively), inequity remains clearly present as outlined below.

Table 3

The results are presented in turn for each characteristic, initially without the inclusion of tariff (Models 1 and 2), and then with tariff (Model 3).

First, in relation to gender, whilst males had a significantly lower chance of being successful when compared with females in both courses across all models, the differences were less marked for medicine (OR=0.82-0.86) than dentistry (0.74-0.76).

Second, in relation to age, whilst overall mature students were less likely to gain admission to dentistry (OR=0.74; 0.81), and much less so medicine (OR 0.45; 0.46); the inclusion of tariff in the model showed that mature students had a much higher chance of success when compared with younger applicants for both programmes; dentistry (OR=2.01) more so than medicine (OR=1.66).

Third, in relation to ethnicity, compared with White applicants, all minority ethnic groups had a lower odds of admission, most notably Black students; this was the case for dentistry and medicine (OR=0.37). In relation to ethnicity, whilst tariff moderated the difference, White applicants were twice as likely to be accepted as Black students to both courses.

Fourth, the odds of admission to dentistry and medicine were significantly lower for all areas of the UK other than Scotland and particularly for dentistry where the odds were less than half. Inclusion of tarriff moderates admission so that Northern Ireland is similar to Scotland and the difference with Wales is reduced, whilst applicants from London and the rest of England continued to have significantly lower odds of admission to both courses.

Fifth, there was a clear social gradient with students from high social status having significantly greater odds of admission to dental and medical school. Tariff clearly moderates the difference for students of medium status to dentistry, this was not apparent for medicine.

Sixth, in relation to school, applicants from selective (independent and grammar) schools had a significantly higher odds of gaining admission to dentistry (OR =1.81 and 1.62 respectively) and medicine (OR = 1.86 and 1.61 respectively) than pupils from state schools, whilst applicants from further education colleges had a lower rate. When tarriff was included (Model 3), students from independent schools had an even higher odds of acceptance for dentistry (OR=1.98) and medicine (OR=1.94), whilst admission from FE Colleges was moderated for both courses, particularly dentistry (OR=0.83).

Summary

This unique study highlights the differences, and parallels, between dentistry and medicine during a period of immense social and professional change across the UK. It is clear that first one must apply; and, second, having received an offer, obtain the necessary tariff score (grades) in support of entry; however, the presence of persistent social, geographic and ethnic inequalities, both in applications for and admissions to dentistry and medicine, over time is stark. It demonstrates that the social gradient is more marked in medicine than dentistry; and, for both subjects, the odds of entering medical or dental school are doubled by attending an independent school rather than a state school. That said, the social gradient in dentistry is not as marked as medicine as exemplified by attracting a higher proportion of state school students, whist medicine is attracting more representative levels of white and black students and achieving greater balance between females and males. This this paper provides robust evidence that the patterns reported in previous cross-sectional research in relation to gender, social status and ethnicity [13, 32] are clearly evident over time and builds on the research in medicine.[33] Additionally, it highlights major differences between the devolved nations and England and that both programmes are very attractive to Londoners and least attractive to English pupils outside of London which has implications for our future healthcare workforce.

Strengths and Limitations

Whilst its strengths include consideration of patterns for medicine and dentistry over time; care, however, must be taken in the interpretation of the findings on the socioeconomic status, school type and ethnicity of students as the categories used by UCAS changed between 1996 and 2011. The continual changes in UCAS variables over time presents a challenge, and one which makes this analysis unique. UCAS now uses the POLAR system (a regional marker of participation) and from 2016, the multiple equality measure (a combination of several 'equality characteristics') instead of a socioeconomic group.[37] Together with the move to only provide summary data to researchers, longer-term analysis is impossible. If we really are serious about tackling inequity in the UK, these data should be more readily available to researchers, as with current NHS data as they have implications for the health of society. Finally, it has to be acknowledged that there are no data on admissions interviews and UKCAT scores which contribute to an offer – these points have been covered in more detail in an earlier publication by the authors.[32]

Who applies – what does the data tell us?

For dental and medical schools to admit (and subsequently educate and train) a representative workforce, and satisfy notions of social justice, capable students from all backgrounds must first apply for the courses.[38] As well as social equality, a diverse student body has been shown to enrich the learning environment of medical schools, with some evidence of students from minority ethnic groups being more likely to practice in underserved areas.[39-41] Although state schools produce the largest group of applicants to dentistry, those from lower socioeconomic groups and those from non-Asian minority ethnic groups, notably Black students, are not applying in the first place. Neither are White students who represent four out of five young people in the national 18-24-year age-band.[42] This may be due to concerns of attainment, low aspirations or possibly for Black students, a poor connection to the dental profession, as demonstrated by the lack of uptake of dental care.[43] For medicine the cultural divide is very clear,[44] [45, 46] representing an ongoing challenge to society.

A stark challenge facing both programmes is that London residents are over-represented amongst UK applicants to dentistry and medicine, comprising one quarter of applicants to dentistry and one fifth of applicants to medicine, compared with 12% of the 18-year old population of the UK.[47] Whereas the high application rate from London may be explained by the diverse ethnicity of London's school children who seek to enter professions;[48] family pressures to live at home[49] and the financial pressures associated with a five- or six-year degree programme; encouraged by the range of opportunities present in London, together with the fact that London schoolchildren outperform the rest of the country academically [50-52] and are thus in a good position to access high tariff programmes. The rationale behind a low application rate from the rest of England warrants urgent consideration as raised in recent media co prominence[53, 54] must be considered in future workforce planning initiatives for England.[55] An attempt to distribute the workforce more evenly was behind the establishment of new medical and dental schools outside of London. Clearly there needs to be further urgent action as region has implications for the distribution of dentists and doctors nationally in the longer-term which have recently come to individual dentists working in England, particularly in underserved areas need to take responsibility for promoting dentistry as a career option in their communities. Local Professional Networks can and should assist with this process, linking to WP initiatives of the most local dental schools in the country. We don't need more dental schools; rather individuals and teams willing to serve the local populace. There is some evidence from a low-income settings that loyalty to serving the population can help with drawing dentists back to serve their home communities.[64]

Who is admitted – and who is under-represented?

The influence of **tariff** on dental admission is clearly demonstrated from this analysis (Table 3). Irrespective of background, to be successful, students need to achieve high grades for these demanding degrees. The effects tariff had on other variables within the model included that maturity of students (having a degree) increases the odds of acceptance over younger counterparts. However, there are concerns over the negative impacts of university fee increases on the quantity of **mature** applicants to university being voiced,[56, 57] and with the number of dental graduate-entry programme places decreasing (with Plymouth University Peninsula School of dentistry no longer providing 4-year graduate entry) this finding is an important message to continue to attract potential graduate applicants. **Male** students had, and still have, [13] lower odds of acceptance than female students to dentistry, this imbalance has not been noted in more recent years for medicine.[33] The under-representation of men in dentistry has implications for the gender balance in dentistry over the longer term; and, may potentially influence workforce capacity. The odds of acceptance for students from independent **schools** was greater than for students from state schools in all three models, increasing in the more recent 10-year period, and even further when tariff was incorporated, highlighting the importance of academic standards. Whilst there is high competition for places at high performing selective schools, it is only those able to afford the fees, or who gain a scholarship, that are able to compete. The advantage for these students may in part be because independent schools are much more likely to provide additional activities to increase tariff score, as well as significant academic and admissions support. Medical schools face similar, if not greater, social challenges, with the majority of UK medical students from the highest **socio-economic** groups, and the one fifth from independent schools (compared with less than 10% of UK secondary school pupils).[38, 58, 59] The resultant influence on student background and identity and, in particular, the disjuncture between working-class perceptions of medicine and individual identities are key to understanding the reasons behind the low number of working-class applicants to medical school.[44,49,65]

Geographic disparities are apparent. The UK is unique in that it consists of four devolved nations, with different fee systems, which potentially influences the applications of students from within those countries. The influence of varying fees and location (and size) of dental schools may account in some part for these disparities. It is important to note that tariff appears to moderate the number of London applicants entering dentistry and they have significantly lower odds of acceptance, thus rebalancing the application rates. However, overall, we need to maintain a secondary focus of how best to provide equitable access to healthcare across the UK.

Dentistry and medicine courses consistently fail to attract, and accept, Black students; only 2.3% of applicants to dentistry between 1996 and 2011 were Black, and 5.2% of applicants to medicine, with only one quarter of these students being offered places (1.5% of accepted applicants to dentistry and 2.5% to medicine were Black). In 2011, 8% applicants through UCAS were Black, and 7% of accepted applicants,[13] and such inequity persist.[13] These challenges have been recognised in ministerial policies whereby the Minister for Universities and Science recently stated that, through their OFFA access agreements, universities will be required to focus their outreach activities on White boys from lower social backgrounds.[60]

Implications

It has been suggested by Angel and Johnson,[61] our healthcare workforce should reflect the diversity of the UK patient population with the professions having a responsibility to 'make access fairer, diversify their workforce and raise social mobility'.[62] We need to take seriously this challenge to ensure that male White and Black students and people in England (outside of London) are encouraged to consider and supported to enter dentistry. Medical and dental schools should perhaps not just consider characteristics of gender, social and ethnic balance but also regional factors. There are no regional quotas for applicants/admissions, but it does raise the question as to how greater engagement from the shires can be stimulated.

Whilst some advances have been made in widening participation to dentistry in recent years (for example, the increases in mature students, those of Asian ethnicity and from state schools) marked ethnic, socio-economic and regional disparities remain. With regard to widening participation to dentistry, measures to broaden the appeal of this career and support in the whole admissions process must continue for students who are male, Black, from non-selective schools, live in England (outside of London) and from lower socio-economic groups, not just in regard to aspiration-raising, but also in attainment, as only those who achieve the necessary tariff points will be considered for admission. Concerns remain that, as in other courses, the financial challenges of studying at university, particularly in England, negatively impacts certain groups of students,[5] particularly those from lower socio-economic backgrounds and mature students,[63] and firmly challenge efforts to widening participation at the present time.

Further research should explore the motivation of and barriers to applying to dental and medical education amongst young people to inform policy makers and admissions policies. Additionally, the experiences of those from under-represented groups who have successfully gained access to dental and medical schools through widening participation initiatives should be explored to

ensure the learning about challenges, barriers and facilitators are well understood and inform change, with a view to facilitating social justice and providing a workforce that meets demand through these changing times.

Finally, in summary, over a period when there was an expansion of higher education places, and the popularity of dentistry and medicine fluctuated, this unique analysis comparing medicine and dentistry demonstrates the extent to which certain groups remained under-represented amongst applicants, with social inequalities clearly reflected in admissions, the findings highlight that females, mature, and White students, and applicants from Scotland and Northern Ireland were most likely to gain admission.. Whilst there is an academic standard to be achieved for entrance to dentistry and medicine, complexity of the societal challenge in accessing these two elite professions in healthcare must not be underestimated. The fact that social status, region of residence and selective schools remain important determinants of entry to these elite professions, emphasises the importance of educational reform in support of equity, with major implications for society.

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Table 1 Characteristics of UK applicants and accepted applicants to Dentistry and Medicine, 1996-2011

Characteristics	Dentistry					Medicine				
	Applicants		Accepted applicants		*% of Applicants accepted*	Applicants		Accepted applicants		*% of Applicants accepted*
	N	%	N	%		N	%	N	%	
TOTAL	**33,773**	**100**	**15,427**	**100**	***45.7***	**199,845**	**100**	**99,478**	**100**	***49.8***
Gender										
Female	17,522	51.9	8,592	55.7	*49*	110,985	55.5	56,929	57.2	*51.3*
Male	16,251	48.1	6,835	44.3	*42.1*	88,860	44.5	42,549	42.8	*47.9*
Maturity										
Direct entry	27,091	80.2	13,056	84.6	*35.5*	142,435	71.3	80,803	81.2	*56.7*
Mature (≥21yrs)	6,682	19.8	2,371	15.4	*48.2*	57,410	28.7	18,675	18.8	*32.5*
Ethnicity										
Asian	15,232	45.1	5,946	38.5	*39*	48,785	24.4	20,462	20.6	*41.9*
White	14,823	43.9	8,250	53.5	*55.7*	125,173	62.6	70,392	70.8	*56.2*
Others	1,348	4	426	2.8	*31.6*	4,973	2.5	1,872	1.9	*37.6*
Black	929	2.3	237	1.5	*25.5*	10,450	5.2	2,450	2.5	*23.4*
Mixed	670	2	283	1.8	*42.2*	5,656	2.8	2,605	2.6	*46.1*
Unknown	771	2.3	285	1.9	*37*	4,808	2.4	1,697	1.7	*35.3*
Region										
Greater London (GL)	8,310	24.6	3,202	20.8	*38.5*	43,966	22.0	17,025	17.1	*38.7*
England - excl. GL	19,262	57.0	8,431	54.7	*43.8`*	123,168	61.6	62,773	63.1	*51.0*
Northern Ireland	2,085	6.2	1,284	8.3	*61.6*	8,928	4.5	5,608	5.6	*62.8*
Scotland	2,557	7.6	1,754	11.4	*68.6*	14,953	7.5	9,394	9.4	*62.8*
Wales	1,559	4.6	756	4.9	*48.5*	8,830	4.4	4,678	4.7	*53.0*
School type										
State	11,981	35.5	5,349	34.7	*44.6*	64,142	32.2	32,147	32.3	*49.9*
Independent	7,550	22.4	4,082	26.5	*54.1*	45,641	22.8	29,172	29.3	*63.9*
Grammar	4,639	13.7	2,576	16.7	*55.5*	22,908	11.5	13,948	14	*60.9*
FE	2,973	8.8	824	5.3	*27.7*	14,828	7.4	4,973	5	*33.5*
Other/Unknown	6,630	19.6	2,596	16.8	*39.2*	52,056	26	19,238	19.3	*37*
Socio-economic status										
High	14,206	42	7,306	47.4	*51.4*	92,980	46.5	52,980	53.3	*57*
Medium	4,750	14.1	2,166	14	*45.6*	21,565	10.8	10,855	10.9	*50.3*
Low	2,940	8.7	1,186	7.7	*40.3*	13,858	6.9	6,101	6.1	*44*
Unavailable	11,877*	35.2	4,769*	30.9	*40.2*	71,442	35.8	29,542	29.7	*41.4*
Tariff [1]										
High	8,928	26.4	6,226	40.4	*69.7*	67,271	46.1	45,390	64.9	*67.5*
Medium	8,778	26	2,655	17.2	*30.2*	37,227	25.5	12,816	18.3	*34.4*
Low	714	2.1	152	1	*21.3*	7,391	5.1	1,783	2.5	*24.1*
Unavailable	15,353*	45.5	6,394*	41.4	*41.6*	34,145*	23.4	9,983*	14.3	*29.2*

Note
1. Tariff points available from 2002 to 2011

Table 2 Percentage of successful UK applicants to Dentistry and Medicine by sex,1996 - 2011

	Dentistry					Medicine				
Year	**Total number of applicants**	**Overall percentage acceptance**	**No. of Female Applicants**	**Percentage of females accepted**	**P value***	**Total number of applicants**	**Overall percentage acceptance**	**No. of Female Applicants**	**Percentage of females accepted**	**P value***
1996	2,420	36.0	1101	40.15	<0.01	10,004	44.69	5148	47.11	<0.0001
1997	2,089	37.3	956	41.53	<0.01	9,426	48.56	4900	50.65	<0.0001
1998	1,813	42.6	849	44.52	0.13	9,272	50.51	4881	53.37	<0.0001
1999	1,573	51.2	796	55.28	<0.01	8,600	56.64	4689	59.01	<0.0001
2000	1,478	54.9	729	58.30	<0.01	8,226	63.57	4660	65.30	<0.001
2001	1,431	59.3	722	61.91	0.039	8,283	68.51	4830	69.46	0.028
2002	1,544	56.3	881	59.70	<0.01	9,658	65.07	5749	66.85	<0.0001
2003	1,688	51.5	941	55.05	<0.01	12,070	57.59	7143	60.00	<0.0001
2004	1,888	48.6	987	50.76	0.046	14,409	50.39	8235	52.77	<0.0001
2005	2,323	48.0	1175	52.68	<0.0001	15,756	45.10	8797	47.04	<0.0001
2006	2,270	45.9	1213	48.72	<0.01	15,394	46.62	8583	49.14	<0.0001
2007	2,477	45.8	1349	48.11	0.01	15,269	46.00	8594	45.89	0.76
2008	2,445	46.6	1304	50.31	<0.01	14,917	47.89	8321	48.08	0.60
2009	2,660	43.2	1452	45.94	<0.01	14,960	47.21	8260	47.06	0.67
2010	2,912	40.9	1592	44.03	<0.01	16,490	42.64	8967	43.05	0.25
2011	2,762	40.3	1475	43.05	<0.01	17,111	40.51	9228	40.41	0.77
Overall	**33,773**	**45.7**	**17522**	**49.04**	**<0.0001**	**199,845**	**49.78**	**110985**	**51.29**	**<0.0001**

*p value is based on comparing proportion of males accepted with females accepted for each course: Dentistry and Medicine.

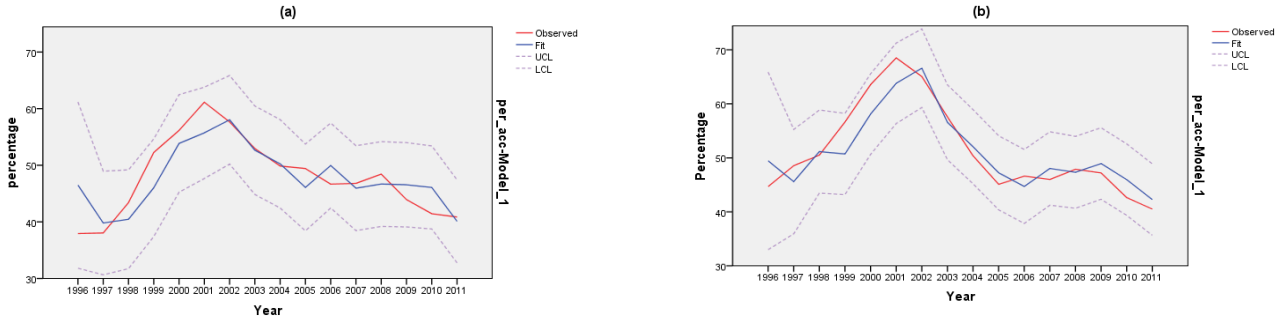
Table 3 Logistic regression model for admissions to Dentistry and Medicine without and with Tariff as a predictor

		Dentistry			Medicine		
Predictors	**Reference Category**	**MODEL 1 (1996-2011) Without Tariff OR (95% CI)**	**MODEL 2 (2002-2011) Without Tariff OR (95% CI)**	**MODEL 3 (2002-2011) With Tariff OR (95% CI)**	**MODEL 1 (1996-2011) Without Tariff OR (95% CI)**	**MODEL 2 (2002-2011) Without Tariff OR (95% CI)**	**MODEL 3 (2002-2011) With Tariff OR (95% CI)**
Sex	Female	1.00	1.00	1.00	1.00	1.00	1.00
Male		0.76 (0.72 to 0.81)**	0.76 (0.70 to 0.82)**	0.74 (0.68 to 0.81)**	0.85 (0.83 to 0.87)**	0.86 (0.84 to 0.89)**	0.82 (0.79 to 0.85)**
Maturity	Direct/early	1.00	1.00	1.00	1.00	1.00	1.00
Mature (≥21 years)	entry	0.74 (0.67 to 0.82)**	0.81 (0.72 to 0.93)*	2.01 (1.61 to 2.52)**	0.45 (0.43 to 0.48)**	0.46 (0.44 to 0.48)**	1.66 (1.48 to 1.86)**
Ethnicity	White	1.00	1.00	1.00	1.00	1.00	1.00
Asian		0.60 (0.56 to 0.64)**	0.64 (0.58 to 0.70)**	0.71 (0.64 to 0.79)**	0.63 (0.61 to 0.65)**	0.63 (0.61 to 0.66)**	0.68 (0.65 to 0.72)**
Black		0.36 (0.29 to 0.45)**	0.37 (0.27 to 0.49)**	0.49 (0.34 to 0.70)**	0.37 (0.35 to 0.40)**	0.37 (0.34 to 0.40)**	0.49 (0.44 to 0.54)**
Mixed		0.72 (0.58 to 0.90)*	0.65 (0.52 to 0.82)**	0.68 (0.52 to 0.90)*	0.73 (0.67 to 0.79)**	0.69 (0.64 to 0.76)**	0.71 (0.64 to 0.78)**
Other		0.46 (0.39 to 0.54)**	0.44 (0.36 to 0.54)**	0.50 (0.38 to 0.65)**	0.58 (0.53 to 0.62)**	0.62 (0.55 to 0.69)**	0.68 (0.60 to 0.77)**
Region	Scotland	1.00	1.00	1.00	1.00	1.00	1.00
Wales		0.43 (0.36 to 0.50)**	0.31 (0.25 to 0.39)**	0.76 (0.58 to 0.99)*	0.68 (0.63 to 0.73)**	0.59 (0.54 to 0.65)**	1.12 (1.01 to 1.25)*
Northern Ireland		0.50 (0.42 to 0.60)**	0.41 (0.32 to 0.52)**	0.91 (0.69 to 1.21)	0.63 (0.58 to 0.68)**	0.57 (0.51 to 0.63)**	1.07 (0.95 to 1.20)
Greater London (GL)		0.38 (0.33 to 0.43)**	0.29 (0.24 to 0.35)**	0.62 (0.50 to 0.78)**	0.50 (0.48 to 0.53)**	0.49 (0.45 to 0.53)**	0.88 (0.81 to 0.96)*
England – exc. GL		0.39 (0.34 to 0.43)**	0.28 (0.24 to 0.33)**	0.46 (0.37 to 0.56)**	0.60 (0.57 to 0.63)**	0.54 (0.51 to 0.58)**	0.78 (0.73 to 0.84)**
Socio Economic	High	1.00	1.00	1.00	1.00	1.00	1.00
Status [2]		0.87 (0.81 to 0.93)**	0.88 (0.80 to 0.97)*	0.90 (0.80 to 1.01)	0.81 (0.78 to 0.84)**	0.84 (0.80 to 0.88)**	0.85 (0.81 to 0.89)**
Medium		0.77 (0.71 to 0.84)**	0.73 (0.66 to 0.81)**	0.75 (0.67 to 0.85)**	0.70 (0.67 to 0.73)**	0.69 (0.66 to 0.73)**	0.70 (0.67 to 0.74)**
Low							
School Type	State	1.00	1.00	1.00	1.00	1.00	1.00
Independent		1.61 (1.49 to 1.73)**	1.81 (1.64 to 2.01)**	1.98 (1.77 to 2.23)**	1.81 (1.76 to 1.87)**	1.86 (1.79 to 1.94)**	1.94 (1.86 to 2.04)**
Grammar		1.44 (1.30 to 1.60)**	1.62 (1.43 to 1.85)**	1.25 (1.08 to 1.46)*	1.59 (1.52 to 1.67)**	1.61 (1.52 to 1.70)**	1.32 (1.24 to 1.41)**
FE college		0.60 (0.54 to 0.68)**	0.70 (0.59 to 0.83)**	0.83 (0.67 to 1.04)	0.71 (0.67 to 0.75)**	0.86 (0.81 to 0.92)**	0.91 (0.83 to 0.99)*
Other		1.12 (1.02 to 1.23)*	1.06 (0.93 to 1.20)	1.29 (1.10 to 1.50)*	1.18 (1.13 to 1.23)**	1.02 (0.96 to 1.08)	1.23 (1.14 to 1.32)**
Tariff	High			1.00			1.00
Medium		-	-	0.16 (0.14 to 0.17)**	-	-	0.21 (0.20 to 0.22)**
Low				0.03 (0.02 to 0.04)**			0.11 (0.10 to 0.12)**

Note
1. Tariff points only available from 2002 to 2011.
** p<0.0001 and * p<0.05.

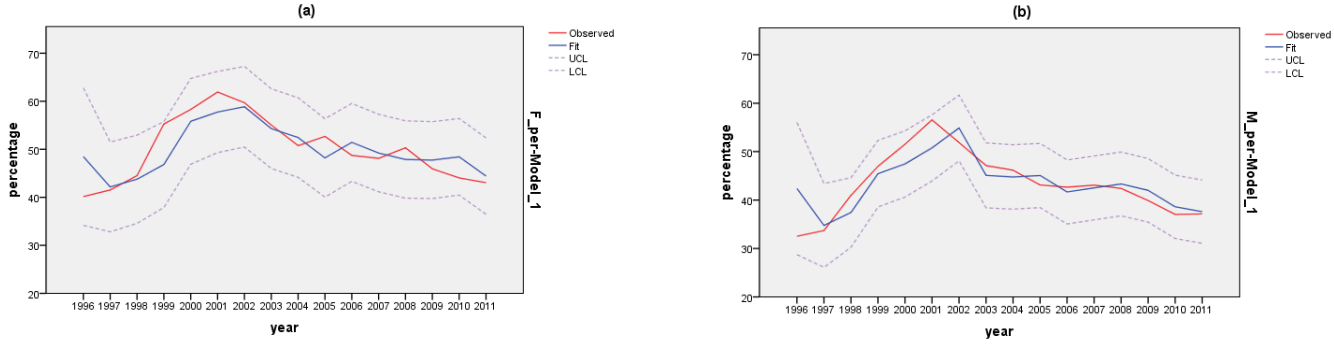
Supplementary File

All

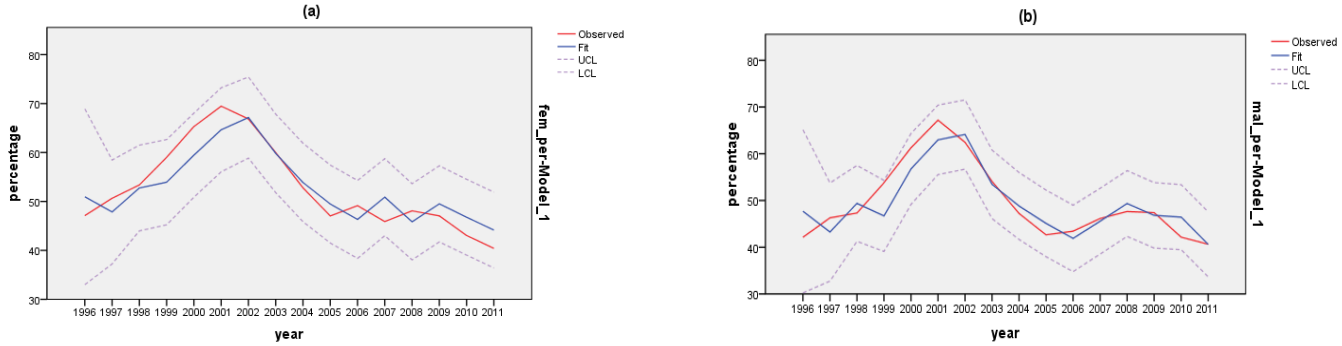


S1 ARIMA models of proportion of acceptance of UK applicants to (a) dentistry and (b) medicine, 1996-2011

Gender

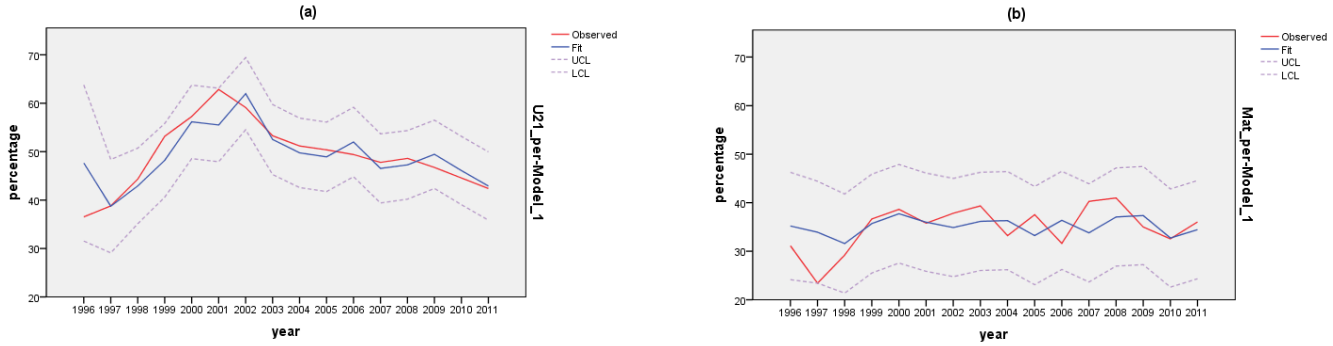


S2 ARIMA models of acceptance of (a) female and (b) male applicants to dentistry, 1996-2011

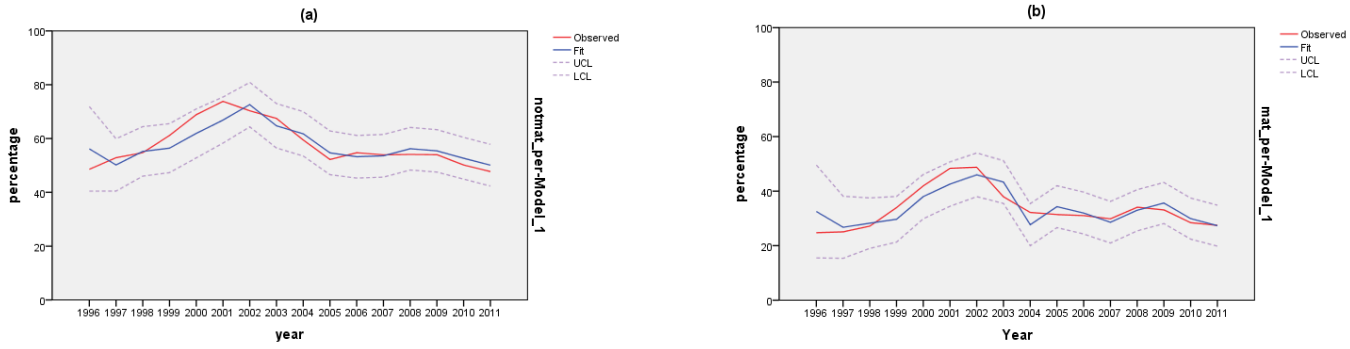


S3 ARIMA models of acceptance of (a) female and (b) male applicants to medicine, 1996-2011

Maturity

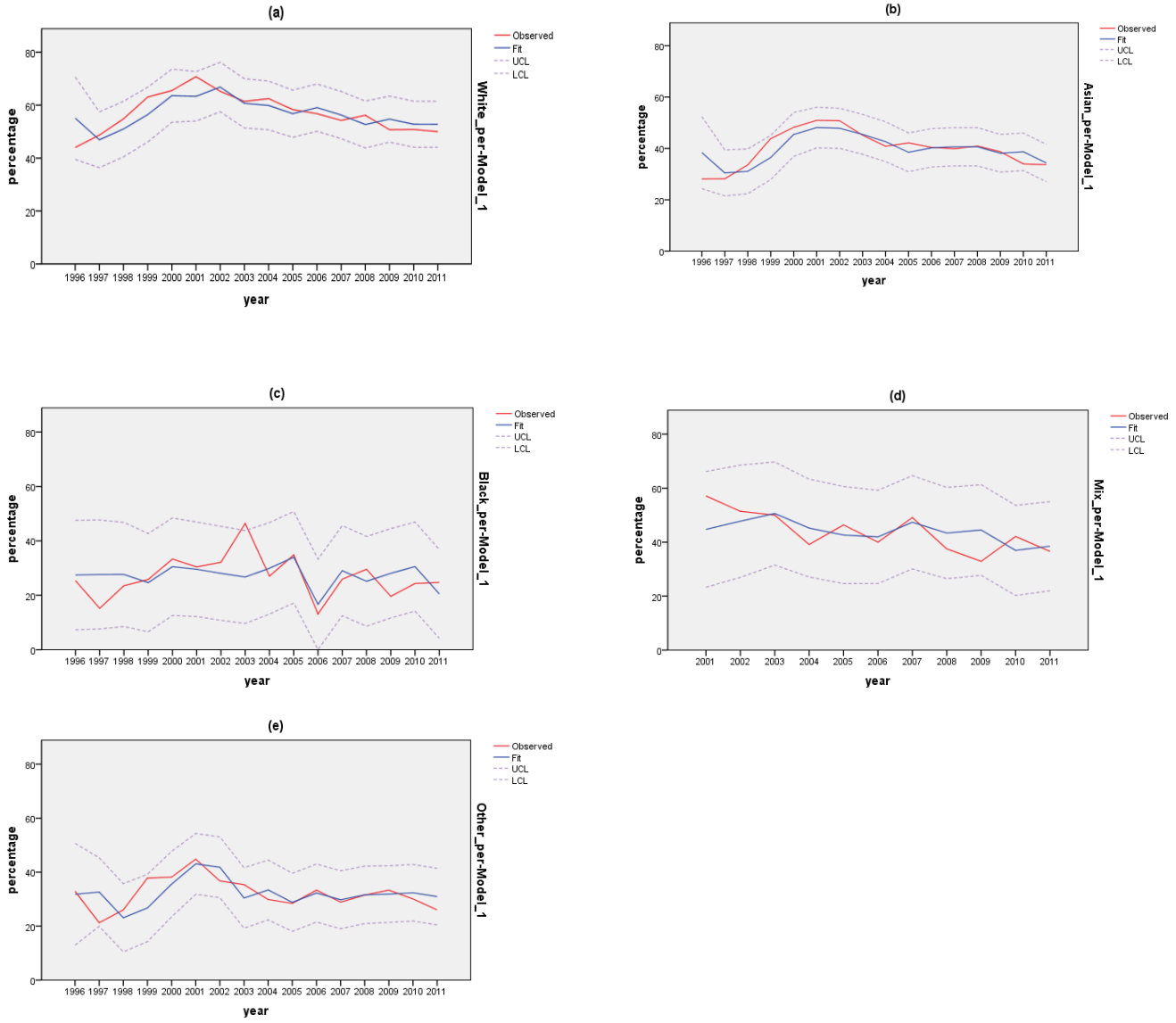


S4 ARIMA models of acceptance of (a) non-mature and (b) mature applicants to dentistry, 1996-2011

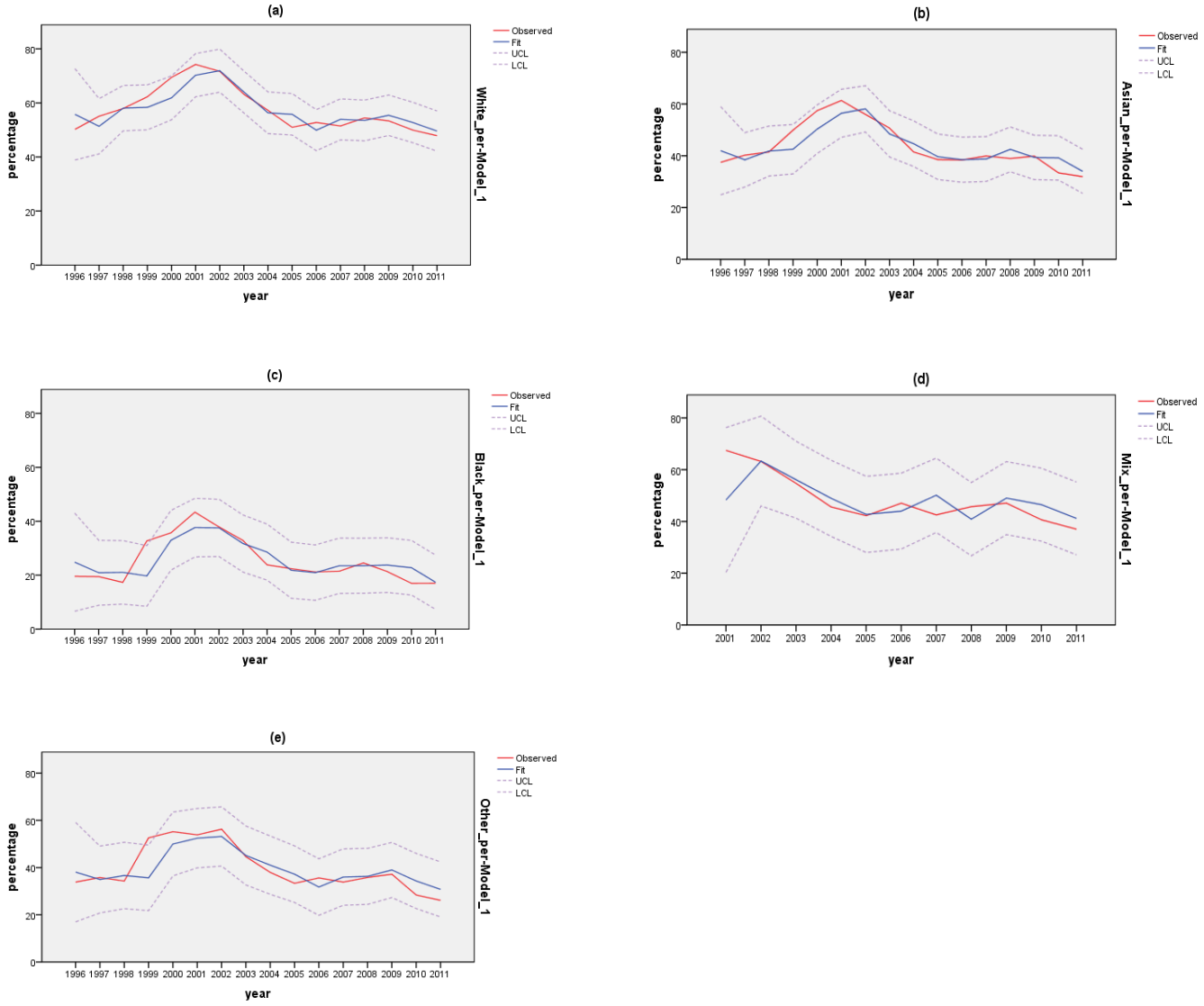


S5 ARIMA models of acceptance of (a) non-mature and (b) mature applicants to medicine, 1996-2011

Ethnicity

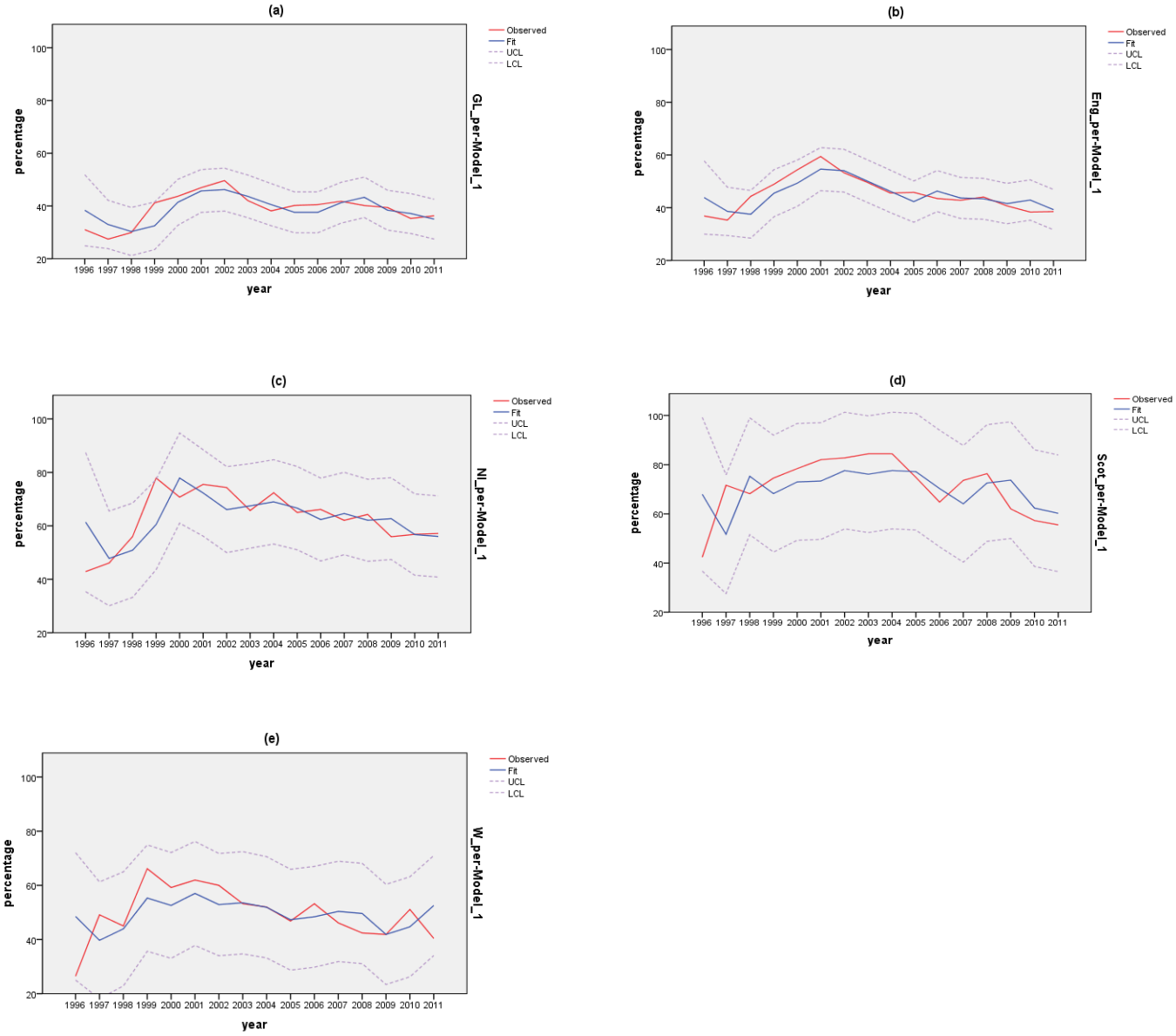


S6 ARIMA models of acceptance of dental applicants of (a) White, (b) Asian, (c) Black, (d) Mixed and (e) Other ethnicities, 1996-2011

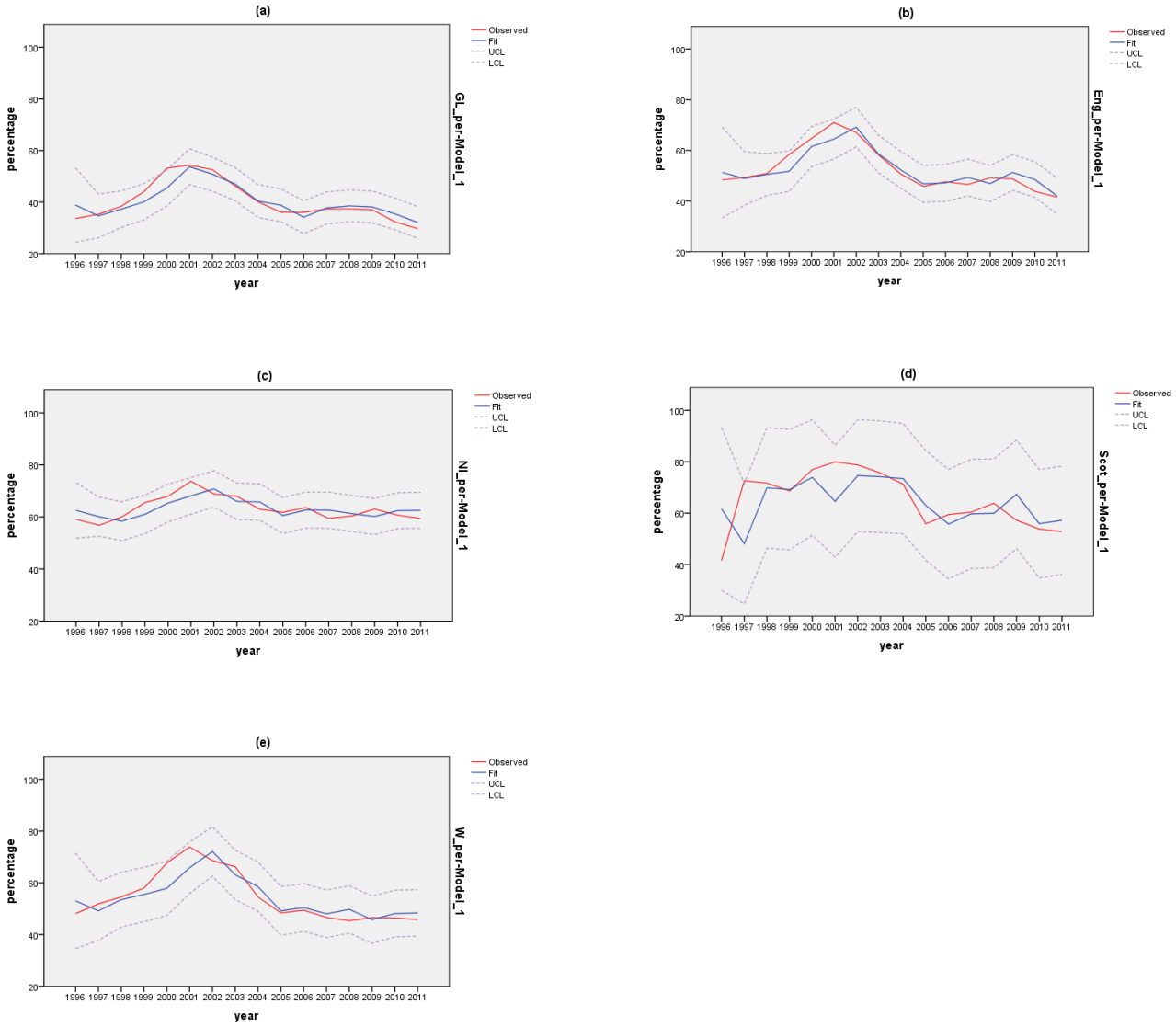


S7 ARIMA models of acceptance of medical applicants of (a) White, (b) Asian, (c) Black, (d) Mixed and (e) Other ethnicities, 1996-2011

Regions within England

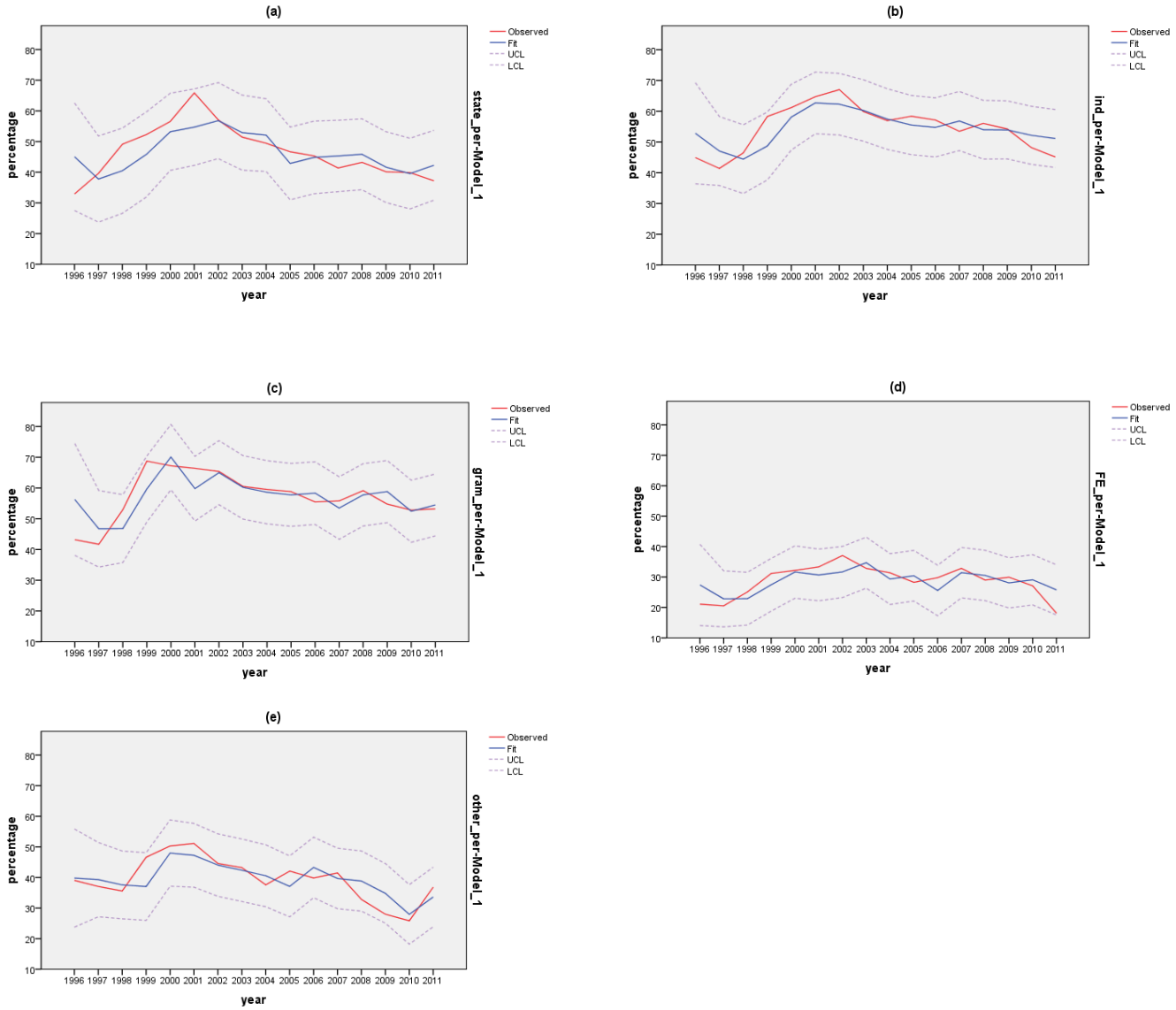


S8 ARIMA models of acceptance of dental applicants from (a) Greater London, (b) England (excl GL), (c) Northern Ireland, (d) Scotland and (e) Wales, 1996-2011

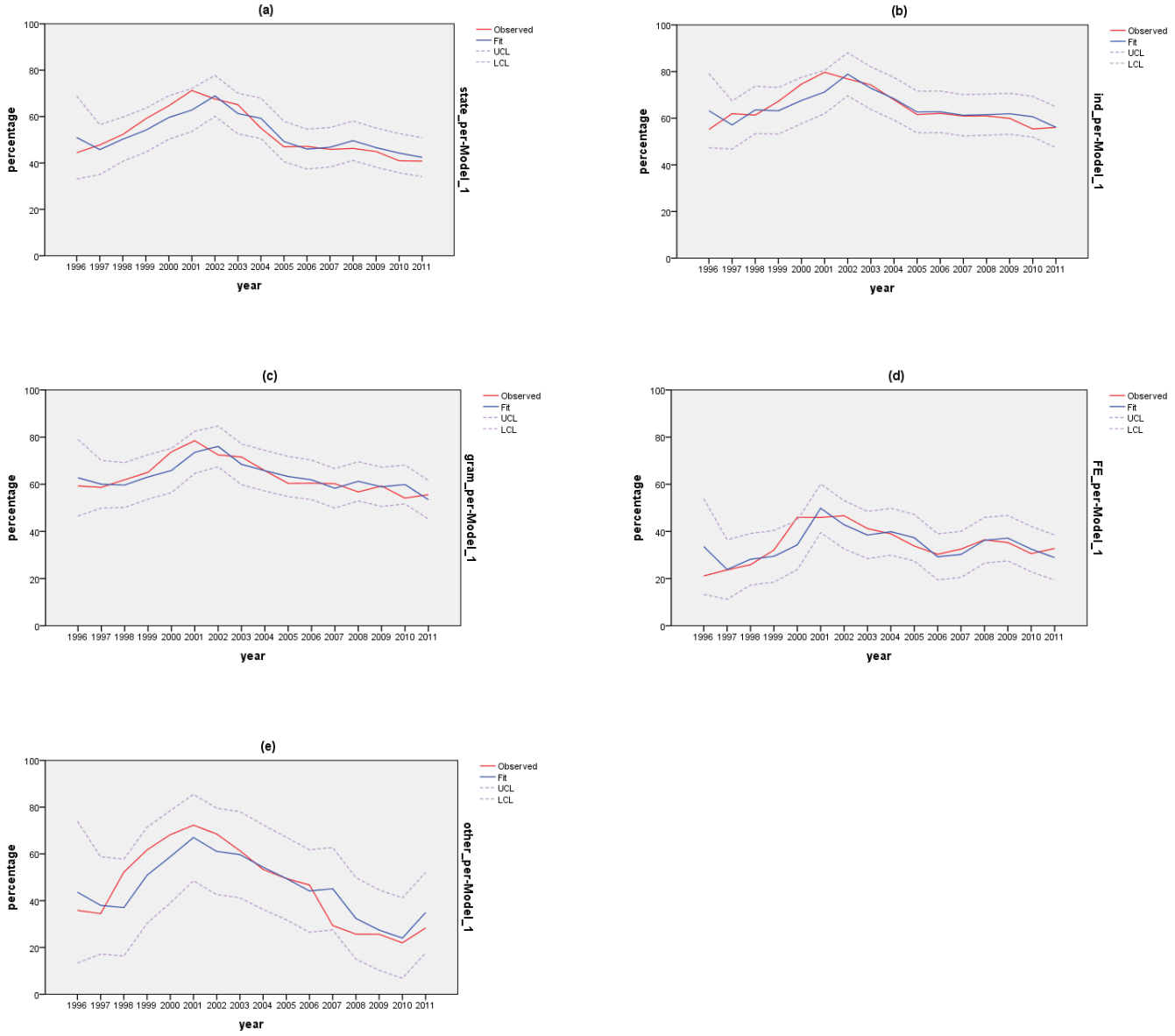


S9 ARIMA models of acceptance of medical applicants from (a) Greater London, (b) England (excl GL), (c) Northern Ireland, (d) Scotland and (e) Wales, 1996-2011

School Type

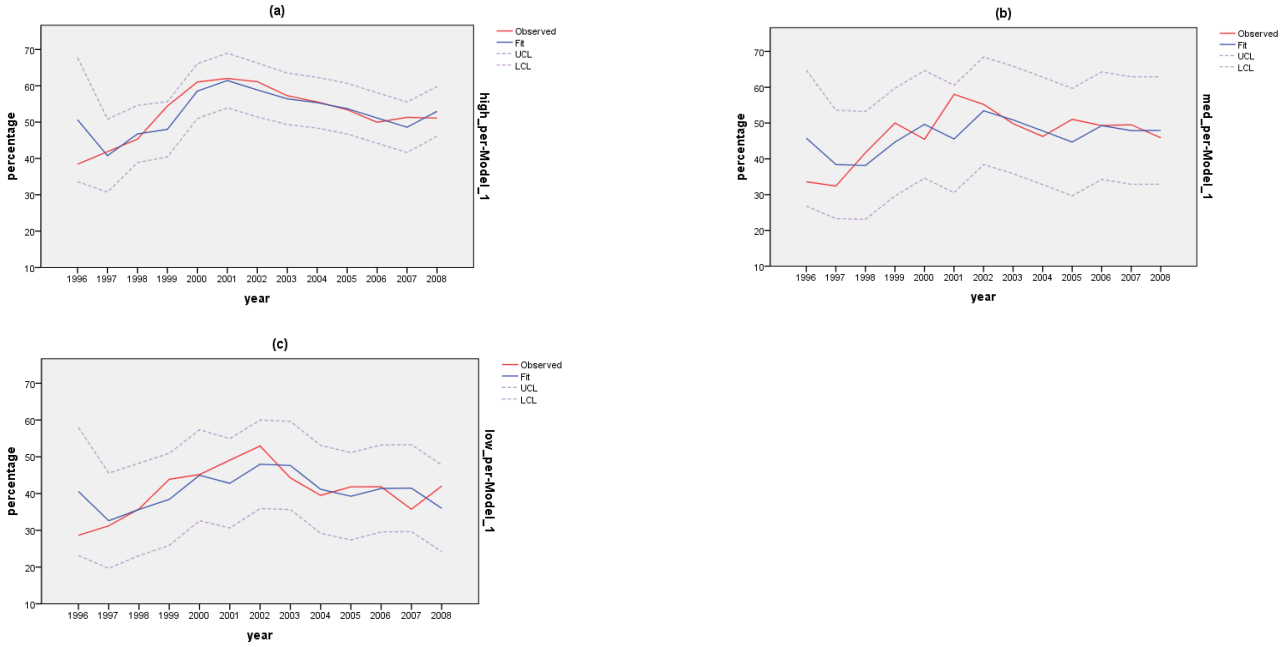


S10 ARIMA models of acceptance of dental applicants from (a) State, (b) Independent, (c) Grammar, (d) FE and (e) Other school types, 1996-2011

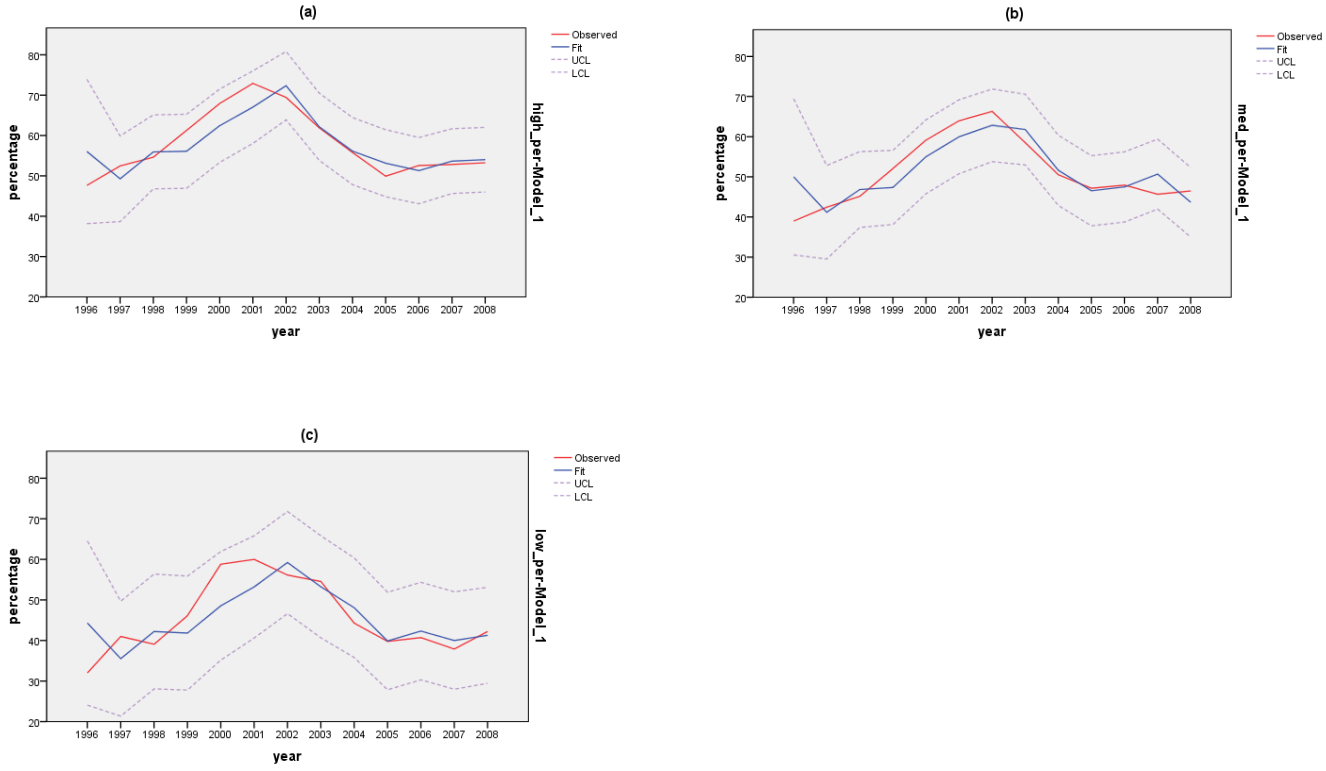


S11 ARIMA models of acceptance of medical applicants from (a) State, (b) Independent, (c) Grammar, (d) FE and (e) Other school types, 1996-2011

Socio-economic group



S12 ARIMA models of acceptance of dental applicants of (a) high, (b) medium and (c) low SEG, 1996-2011



S13 ARIMA models of acceptance of medical applicants of (a) high, (b) medium and (c) low SEG, 1996-2011